Exercises 2.1

Prove that the equations are conditional equations. State the replacement set for each equation.

Example

$\sin x + \cos x = 1$.

Solution

$\mathscr{D} = R$.

$\frac{\pi}{4} \in \mathscr{D}, \sin \frac{\pi}{4} + \cos \frac{\pi}{4} = \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} = \sqrt{2} \neq 1$.

1. $\cos x - \sin x = 1$.
2. $\sec x - \tan x = 1$.
3. $\cos x = \frac{1}{\sin x}$.
4. $\sin 2x = 2 \sin x$.
5. $\cos 2x = 2 \cos x$.
6. $\sin x - \cos x = \cos x - \sin x$.
7. $\sec x - \csc x = \tan x - \cot x$.
8. $\cos \frac{x}{2} = \frac{1}{2} \cos x$.
9. $\sin \frac{x}{2} = \frac{1}{2} \sin x$.
10. $\tan \frac{x}{2} = \frac{1}{2} \tan x$.
11. $\tan 2x = 2 \tan x$.
12. $\frac{\tan x + 1}{\sin x} = \sec x$.
13. $2 \sin x - \cos x + 1 = 0$.
14. $\cos x - 2 \tan x + \sec x = 0$.
15. $\csc x - \sec x = \sin x - \cos x$.